

# RETURN

(125)

To an Order of the House of Commons, dated April 23, 1906, for a copy of the Report of A. E. DuBerger, on the Drug and Proprietary Medicine Trade of Canada.

R. W. SCOTT

Secretary of State.

To the Honourable the Minister of Inland Revenue,  
Ottawa, Canada.

SIR,—Acting according to your instructions given me on the 5th of April last, I have the honour to submit that—

The importance and scope of the work intrusted me was such that I could not, in order to give an exact and true idea, judge by my own personal experiences. Nor would I have been justified in making a report based exclusively on theory.

In order to be in a position to inform you positively on the extent of drug adulteration as well as pharmaceuticals' adulteration, it was necessary for me to travel considerably and get my information from persons whom I deemed to be best in a position to furnish same.

Beginning my work in the first days in May last, I have visited principally the following localities: Sherbrooke, St. Hyacinthe, Montreal, Sorel, Quebec, Three Rivers, St. John, N.B., Halifax, Windsor, London, Hamilton and Toronto. My mission has in some of those localities, necessitated a longer stay than I had anticipated, in order to see the persons I wanted to, and who were in a position to give me the information I wanted. I have taken advantage of my presence in those centres to visit in all their details a few large manufactures of pharmaceuticals, which have gained such an importance in the course of the last few years.

The Adulteration Act reads thus:—

'(f) Every drug shall be deemed to be 'adulterated' within the meaning of this Act,—

- (i) if, when sold or offered or exposed for sale under or by a name recognized in the edition of 1898 of the British Pharmacopœia, it differs from the standard of strength, quality or purity laid down therein;
- (ii) if, when sold or offered or exposed for sale under or by a name recognized in any foreign pharmacopœia, such as *le Codex Medicamentarius* in France or the Pharmacopœia of the United States, and having the name of such pharmacopœia, plainly labelled, upon the article it differs from the standard of strength, quality or purity laid down therein;
- (iii) if, when sold, or offered or exposed for sale, under or by a name which is not recognized in any pharmacopœia, but which is found in some generally recognized standard work on Materia Medica or chemistry, it differs from the standard of strength, quality or purity laid down therein;
- (iv) if its strength, quality or purity falls below or differs from the professed standard under which it is sold or offered for sale.



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(g) Provided that the foregoing definitions as to adulteration of food and drugs shall not apply.

(1) If any matter or ingredient not injurious to health has been added to the food or drug because it is required for the production or preparation thereof as an article of commerce, in a state fit for carriage or consumption, and not fraudulently to increase the bulk, weight or measure of the food or drug, or to conceal the inferior quality thereof, if each package, roll, parcel or vessel containing every such article manufactured, sold or exposed for sale is distinctly labelled as a mixture, in conspicuous characters forming an inseparable part of the general label, which shall also bear the name and address of the manufacturer.

(2) If the food or drug is a proprietary medicine, or is the subject of a patent in force, and is supplied in the state required by the specification of the patent.

(3) If the food or drug is unavoidably mixed with some extraneous matter in the process of collection or preparation.'

The object of my work is to lay before you, as near as possible, a report stating the extent of drug adulteration in the country and furnish a list of drugs most often found adulterated on the market. That work is, in appearance, a very easy one. But when one realizes the importance of the subject and the comparative exactness required and the difficulty in procuring all the information, it will be found that it is much more arduous and complicated than, at first sight, thought.

Drug adulteration has still less reasons to exist than food adulteration. In the latter case, generally, the adulterator has for his object, the reduction in price to the consumer as a means of increasing his sales. It is much different with drugs, the retail price of which is, as a rule, maintained to its normal figure, and therefore the adulterator is the only one to derive any benefit from it.

Adulteration is therefore, nothing else than an abominable fraud. That fraud might have very serious consequences. First, it is a means of obtaining money under false pretences, from the poor as well as from the rich; second, life or at least public health is in danger for the sake of a small gain. There is a third serious consequence in the sense that it is a block in the progress of *Materia Medica*, in as much as the physician does not get from the medicine he prescribes the effect he expects from it, and if he has no reason to believe that the goods supplied are adulterated, he will lay the whole blame on the drug itself and will refuse to use in the future, a medicine of real value when offered in good condition.

Before going any further, I will cite Hassal who defines adulteration as follows:— 'It consists in the intentional addition to a substance, of one or several substances, the presence of which is not mentioned in the name by which such substance is known.' In this case this definition is incomplete in as much as it does not include the substitution of an inferior article to the one of superior and recognized quality that is supposed to be employed. That often occurs in preparations composed of vegetable drugs. For instance chincona bark ought to, according to the *British Pharmacopœia*, contain no less than five per cent of total alkaloids of which no less than half should consist of quinine and cinchonidine. Still cinchona will be found that contains from two to seven and eight per cent. of total alkaloids. But the determination of total alkaloids alone is not sufficient, as a large proportion may be cinchonine and amorphous alkaloid; and a bark, although containing six per cent of total alkaloids, would be of low medicinal value, under those conditions. Belladonna is often of bad quality, having become deteriorated or often having undergone more or less exhaustion.

It may be remarked that by purchasing the drugs from reliable firms the above-mentioned adulterations are not likely to be often met with. This is no doubt true, but unfortunately, druggists are often tempted by the low prices at which drugs are offered by some unscrupulous wholesalers.

Thus, in a report of the New York State Board of Health, we find that the following drugs bought at random from various druggists, were found adulterated.



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Name of Drug.	Number of samples analysed.	Number found adulterated.
Seneca root.. . . . .	23	5
Virginia snake root.. . . . .	21	1
Sarsaparilla root.. . . . .	23	14
Digitalis leaves.. . . . .	22	10 (deteriorated)
Spanish saffron.. . . . .	20	17
Myrrh.. . . . .	21	6
White wax.. . . . .	17	6
Oil of cocoa.. . . . .	19	6
Quince seeds.. . . . .	13	7
Lupulin.. . . . .	18	7
Arrow-root.. . . . .	20	8
Ipecac, powdered.. . . . .	23	10
Jalap, powdered.. . . . .	22	8
Orris, powdered.. . . . .	19	9
Rhubarb, powdered.. . . . .	23	6
Mustard, powdered.. . . . .	24	12

During a single year the Massachusetts State Board of Health detected the following adulterated drugs:—

*Acidum Tannicum*.—Ten samples examined; five found to contain resin or foreign gums.

*Aether*.—Two samples examined; both contained too much alcohol.

*Aqua ammonia fortior*.—One sample; too weak.

*Bismuth subnitrate*.—Ten samples analyzed; five contained carbonate.

*Calx Chlorata*.—All of the samples analyzed found below standard.

*Extractum Glycyrrhizæ*.—Nine samples examined; all found to contain cornstarch.

*Ferri et quininæ citras*.—Eight samples examined; two contained insufficient quinine.

*Glycerin*.—Twenty-nine samples examined for arsenic; twenty were found to contain from traces to 0.002 in 25 grammes of samples.

*Limonis succus*.—Twelve samples analyzed; all adulterated or impure.

*Oil of lemon*.—Six samples analyzed; five contained oil of turpentine.

*Olive oil*.—Fifty samples examined; thirteen consisted wholly or in part of cotton seed oil.

*Potasium Bitartrate*.—Of twenty samples examined, two were adulterated with cornstarch, gypsum and acid phosphate of lime.

*Sulphur precipitated*.—Of fifteen samples, ten contained calcium sulphate.

*Tr. Opii*.—Of thirty-nine samples, thirty-four were found below the standard.

The last, of course, indicates that the crude opium from which the tincture was made, was not of standard strength.

Thus we have an average adulteration of 34.74 per cent. This in a state which enjoys a pure drug law well conceived and admirably executed. What can we expect to find in countries possessing no such law or when having one in the statutes, it is not executed?

Adulteration might be divided in four distinct sections:—

(a) *Conventional adulteration* (often found) would be the artificial coloration or coating of a drug such as the coating on ginger.



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(b) *Accidental adulteration*.—Drugs containing usual mixtures of foreign matter, such as dirt, stems, twigs, pods, foreign leaves, deteriorated and exhausted material.

(c) *Arbitrary adulteration*.—In order to deal effectively with adulterations it is necessary to adopt some standard. In certain countries it is a minimum one and manufacturers dilute a superior product so as to comply with such an adopted standard.

(d) *Intentional adulteration*.—The underlying motive for dealings of this character is monetary gain. Examples of this class are mixtures of potassium cyanide and sodium cyanide delivered as potassium cyanide, prime quality drugs mixed with inferior goods and beeswax adulterated with paraffin, &c.

Intentional adulteration is comparatively scarce amongst the retail druggists. As a class, there are very few that can compare favourably with the druggists for honesty and good faith.

If drugs adulterated in the sense of sections (a) and (b), are found or bought from retail druggists, it would be hardly fair to hold them responsible altogether. Professor Rusby has demonstrated that the United States government allowed the country to be flooded with impure and adulterated drugs. In some cases, such as assafœtida, it is practically impossible to procure the right article on the market. And that, notwithstanding the fact that enormous sums of money are spent every year in order to prevent the importation of inferior drugs.

The field of operations of the professional adulterator is principally in the country and far off places. In those localities where there is no druggist and very often no physician, the general merchants handle drugs of every day use, such as castor oil, cod liver oil, olive oil, paregoric, Epsom's salt, Rochelle's salt, senna, seidlitz powders and many others. The retailer of those goods is, in no way in a position either by his training or his education, to control the purity or quality of the drugs he is handling. Those merchants being in good faith will be supplied with bottled castor oil for internal use, that is hardly fit for lubricating purposes. That oil, often given to infants, is the cause of many troubles and is sometimes dangerous. A few years ago, there was sent to Canada a lot of petroleum oil of some kind which had been sold, and labelled so, for castor oil. The chemist of one of the best wholesale drug houses in Canada detected the adulterated article and the lot sent to that firm was refused, but lots of the same product had found their way through the country and no doubt had been sold to people not in a position or not desirous to detect the fraud. The same rule might apply to all the drugs I have just mentioned, and specially to seidlitz powders.

In my estimation, to be violating the law it is not absolutely necessary to intentionally introduce in the article adulterated substances which would be used as adulterants, but the fact of selling deteriorated drugs ought to constitute an offence. And this would apply specially to the case of seidlitz powders, which are frequently sold in a deteriorated condition.

In regard to the adulteration just mentioned, it is my opinion that the inspecting should be specially made where the goods are bottled or manufactured.

The field of action of the occasional adulterator is rather in the large cities, where the retailer is called upon to fill physicians' prescriptions and family recipes. Nevertheless, I am bound to say that the large majority of retail druggists are very conscientious, and that it is but the very small number who practise what we call *substitution*, which is only a mitigation to adulteration.

In order to protect the public in the most practical way, it is necessary that the law be put into force seriously and cases brought against all offenders. The reputation of the adulterator being at stake, it is a sure thing that once he will have been punished for such an action and the case is made public, there are very few chances for him to repeat the trick.

Lately there was a booklet published which explained a number of possible ways and means of adulterating several drugs. That booklet might be of great use to



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merchants who think nothing of the quality of the goods they supply as long as they receive money for what they give. But it might prove to be a poor investment if the law was applied properly in their case.

The statistics furnished by the Inland Revenue Department of Canada are not sufficient to form an exact idea of the situation.

In 1889 Bulletin No. 12 was issued, and referred to cream of tartar. Eighty-six samples of cream of tartar were examined, of which 24.4 per cent were found more or less adulterated.

In 1891, on the 11th of May, Bulletin No. 23 was issued. It referred to sweet spirits of nitre and diluted prussic acid, nine samples of each of those drugs having been gathered, all in the city of Montreal. The result of the examination has shown that out of that number four did not correspond to the strength laid in the British Pharmacopœia, two were adulterated and three were up to standard. The analyst made a memorandum to his report, which is very just and reasonable, and reads as follows: 'As both of these substances are liable to deteriorate on keeping, even if they are originally pure and of full strength, I have placed a separate column for those which came below the B. P. strength, but which may not have been adulterated.'

In 1893, on the 10th of July, Bulletin No. 34, referring to alcoholic tinctures, was issued. Samples of eleven kinds of official B. P. tinctures were gathered, in all one hundred and three. Out of that number forty-seven were considered adulterated.

In 1895 Bulletins Nos. 40 and 42 were issued; but as they referred altogether to paris green, we cannot consider them as relating to drugs, properly speaking.

In 1897, on the 7th of May, according to Bulletin No. 48, ninety-eight samples of ground ginger have been analysed, of which fifty-six were declared pure, three are doubtful and thirty-nine adulterated.

In 1898, Bulletin No. 58, forty-eight samples of belladonna plasters were examined. According to the British Pharmacopœia, belladonna plaster ought to contain at least 0.5 per cent of the alkaloids; none of the forty-eight were proved to be up to the requirements.

The 15th of July, 1898, bulletin referring to infants' and invalids' foods, bearing No. 59, is issued. These cannot be considered as drugs, although sold by druggists.

On the 31st of October, 1898, in Bulletin No. 60, Mr. Frankland T. Harrison, public analyst in London, Ont., reports having examined several samples of tincture of opium; and Mr. W. H. Ellis, public analyst of Toronto, also reports having examined eight samples of the same tincture. Out of those fifteen samples two are found too strong in morphine, seven are deficient and six are exactly as required by standard. The same analysts have examined seven samples of citrate of iron and quinine, and the result shows that four were found adulterated.

On the 31st of December, 1898, Mr. Harrison reports having examined eight samples of each, quinine wine and tincture cinchona. He finds four of each kind adulterated. (Bulletin No. 62.)

Bulletin 63, March 24, 1899, treats of commercial beef extracts, which cannot be considered as drugs, not being properly speaking a medicine.

Bulletin No. 71, issued September 10, 1900, treats of sixty-five samples of cream of tartar, of which twenty-six are found good, twenty bad, ten good enough, but not up to B. P. quality, two remain doubtful and seven are decidedly adulterated.

On the 1st of June, 1901, Bulletin No. 77, sixty-four samples of effervescent sodium phosphate are examined. Thirteen are found to be good, the balance are more or less adulterated, and in different manners.

Bulletin No. 79, issued on the 29th of October, 1901, refers to fifty samples of turpentine (oil of turpentine) examined. It is indicated that 16 per cent of that oil on the market is adulterated.

Bulletin No. 88, July 31, 1903, refers to paris green.

Bulletin No. 109, on the 19th of September, 1903, out of one hundred and eighty samples of cream of tartar thirty-four are found adulterated and fourteen doubtful.



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Wherever I have been I found people complaining that adulteration is practised and specially by merchants who supply the general merchants with drugs and also those firms who make it a specialty to supply country physicians, the latter certainly having no time to spend in verifying the goods sent them and must necessarily trust to the merchant supplying the goods.

Within the last few years, the consumption of pharmaceuticals manufactured by large manufacturing concerns has acquired an extraordinary development. Nowadays, it is very seldom that we can meet with a retailer who himself, manufactures the pharmaceuticals he has to sell his customers. The different new processes adopted by the pharmacopœias are complicated enough to require, for their performance, expensive well equipped modern laboratories, in order to attain the perfection required. It is thus that the retailer has to depend upon his confrère the manufacturer who, having to supply a large number of retailers, is in a position to invest the necessary capital to perform such work.

Considering that state of things, it would be advisable that the inspection in that line of goods would be principally carried in the factories and thus protecting the retailer against an unscrupulous manufacturer who never hesitates to claim a superiority for his goods.

In order to supply an article above all suspicion and absolutely equal to standard, the large manufacturer must be a man of great character and must have a system of absolute control on the quality of the goods he employs, in his laboratories, in the manufacturing of his different preparations. In order to ascertain that his product is exactly as described on the label, he must also have a system of control of the finished product, because, for convenience the different stages of manufacture have been looked after by different persons. Should any one of the different operators make a mistake, the whole preparation would be deficient in some way, without the knowledge of the other operators, and would be different to the recognized formula.

It is absolutely necessary that the physician should rely entirely on the formula of a preparation furnished him, in order to use it with advantage in his practice. What would one think, for an example, of a firm who would sell an hypnotic preparation supposed to contain a given quantity of bromide of potassium, chloral hydrate, henbane and Indian hemp and who would for the sake of gain, substitute morphine to one or more of those hypnotics? The physician and the druggist as well as the client have the perfect right to get what they expect to get. It has even been demonstrated that unscrupulous manufacturers deliver samples of goods to physicians absolutely made according to the formula they have published, but deliver to the retailer for consumption, a product altogether different in quality and strength.

All those manufacturers publish periodically catalogues or price lists, which go to prove that they manufacture thousands of different preparations. Those preparations are all sold in fairly large quantities to retail druggists. Those latter men are, therefore, merely intermediaries between the manufacturer and the consumer or the physician who thinks fit to supply the medicine directly to his patients. It goes without saying that the word of the manufacturer is the only data to go by and no control whatever exists on the truthfulness of his claims. Sometimes, in order to meet competition, the prices set for some of the pharmaceuticals are so low that it is only reasonable to have doubts as to his good faith.

The high price of alcohol is the direct cause of the adulteration of preparations containing same or for the manufacture of which it is used. There are now on the market, preparations, such as tinctures, supposed to be made exactly according to the requirements of the British pharmacopœia, sold at a lower price than the retailer can buy the alcohol alone he would use to manufacture them at home. Some druggists have assured me that they are convinced that in a good many of those articles, wood alcohol has been entirely or for a good part substituted for ethyl alcohol, or that in some cases the alcoholic strength is deficient.



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Is it proper to use wood alcohol? That question has been often discussed. Some have contended that methyl alcohol could be used with as much advantage and without any danger, in preparations exclusively for external use. F. T. Gordon, pharmacist of the United States navy, claims that methyl alcohol can be thus used and also in the making of toilet waters and for extracting principles as a solvent, provided alcohol is afterwards recovered. But on account of the action of iodine on methyl alcohol or its impurities, says it cannot be used without danger in the making of tincture of iodine. That opinion is far from being shared by the greatest number of authorities who have made a special study of the matter, especially medical oculists.

The perfection attained in the purification of methyl alcohol is such that it is difficult to recognize it from ethyl alcohol without resorting to chemical tests. The difference in the price is such that unscrupulous manufacturers have used it to make preparations having a ready sale and the prices of which have been cut down by competition.

Referring to the dangers of the use of wood alcohol, here are a few facts and observations.

Dr. A. G. Thompson (*Pharmaceutical Review*, February, 1901), as early as 1897, reports an instance which came under his observation, of complete blindness caused by the drinking of an essence of ginger.

During 1898-1899, Kuhnt, MacCoy and Michael, Moulton, Holden, Gifford, Patillo, Callan and others report cases of blindness from the drinking of methyl alcohol.

In February, 1899, Hiram Wood reports in the *Ophthalmic Record*, six cases of total blindness caused by the substitution of an essence of ginger for other alcoholic drinks.

As long ago as June, 1877, Viger published an account of a similar case in *l'Année Médicale*.

On March 6, 1900, at Grisfield, Maryland, a man, after drinking a large quantity of an essence of ginger, was taken violently ill, and though given careful treatment in a Baltimore hospital, subsequently became entirely blind.

On April 19, 1900, a man at Circleville, West Virginia, drank some essence of lemon in lieu of whiskey or brandy. Although experiencing almost total blindness during the next few days, his sight gradually grew better.

On September 6, 1900, at Fawn Grove, York county, Pa., the drinking of some essence of ginger resulted in the death of two men and total blindness of another.

The essences causing the trouble in the three above mentioned last cases were all manufactured by one firm, and, samples having been obtained, they were subjected to analysis, the result was published by H. P. Hynson and H. A. Brown Dunning, in the *Pharmaceutical Review* of February, 1901. It showed that they contained 75 per cent of a purified and deodorized wood alcohol. They add: 'We believe that the results secured are such as to convince almost any one that wood alcohol is present in large quantities in the essence of ginger examined. It must also be concluded, since the tincture of ginger made with ethylic alcohol has never produced the toxic effects and sight destroying, that methylic alcohol is entirely unfit for internal administration.'

In the *Bulletin of Pharmacy* of March, 1901, an instance is reported of a party of four men having indulged in the drinking of some essence of ginger that resulted in the death of two, and only the most active efforts on the part of the physicians saved the other lives.

The *Druggists' Circular* of March, 1901, reports another case in which a sailor, during 'shore leave,' drank a quantity of essence of ginger. He experienced the following symptoms, which are the same as those experienced in the cases already mentioned: A very severe headache about half an hour after drinking the essence, expectorating, excessive perspiration, dilatation of the pupils and delirium. Within the twenty-four hours, the delirium, as well as the other symptoms, disappeared, but



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a complete blindness remained. For two months the sight gradually grew better, but total blindness subsequently resulted.

A strong dose of wood alcohol, taken on an empty stomach, has caused death within a few hours, while it has been remarked that the patient recovered complete health after taking a small dose under the same circumstances.

The instance cited by Drs. MacCoy and Michael, several years ago, was that of a young man, who, while convalescing from measles, succeeded in obtaining two ounces of methyl alcohol, the article being a highly purified one. Two hours afterwards took a similar quantity, and as a result experienced the usual immediate symptoms, and eventually almost total blindness. Commenting upon these cases they say: 'There can be no reasonable doubt that all the people mentioned above were poisoned by wood alcohol; as, in addition to the finding of that substance in the ginger preparations, it is shown that the same result followed the use of a peppermint essence in which it was also detected.'

'Whether the wood alcohol used in making the preparations which have brought about such dire results was crude or purified is apparently unknown. It is reasonable to infer, however, that any one employing it for such purposes would choose the latter on account of its comparative freedom of disagreeable odour.

'The foregoing should sufficiently dispose of all theorizing as to the possible harmlessness of a purified wood alcohol. Even if it were known that it could be so purified as to render it no more harmful than grain alcohol, one would have to remember that there would always be uncertainty as to its purification having been fully accomplished. With ordinary alcohol we have no parallel risk.'

Dr. Moulton writes, in November, 1902: 'It is worth noticing that no other substance, taken internally, chooses for its action the optical nerve, as does wood alcohol. Those who have observed and registered the cases of blindness caused by that substance, mention specially thirty cases where quantities varying from a quarter of an ounce to one wineglass full have been taken internally, and by which the persons have been affected. Out of that number fifteen, 50 per cent, lost their sight completely. One of the first cases registered was so in 1899. There had been a few before and others have followed, so that now there are fifteen or more given in print. There are also twelve or more cases in which essences have been used, and that is sufficient to permit a comparative statement. The analyses of the fifteen cases in which wood alcohol had been used and of the twelve cases in which essences had been the subject of the observations, show the exact similitude of symptoms in the different cases.'

Again, in 1902, in a report furnished by the Johns Hopkins Hospital, Dr. Reid Hunt submits the result of a special research made in order to determine the poisonous effects of wood alcohol. The result shows that its purification destroys in no way its poisonous character. It is even recommended not to use externally; the fact that its vapours alone are bad on the eyes is sufficient warrant against its use. An agent possessing such properties might cause troubles that we could not readily attribute to it.'

On the 10th of February, 1903, Dr. J. A. Degheen, of the New York Board of Health, states that out of two hundred and fifteen samples of spirits of camphor he had analysed, he found forty in which a highly purified wood alcohol, known as Columbian spirits, had been used as a solvent for the camphor. In some cases the label went as far as stating a dose for internal use.

In the first days of 1904, Drs. Buller and Finch, authorized by the American Medical Association, held an inquest on the effects of wood alcohol on the system. Dr. Buller made a list of a large number of cases of total or partial blindness which could reasonably be attributed to the absorption of wood alcohol, whether by ingestion or inhalation. Dr. Wood, after having exchanged a large correspondence with prominent oculists and physicians, tried to write the history and description of cases not yet reported by the medical press. In that work he received generous help from the surgeon general of the army, the commissions on adulterated drugs and foods of different states and several chemists who had made special researches and experiments



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in the matter. Moreover, a good number of the coroners allowed him to look into their reports. As a result of these researches, it was demonstrated that wood alcohol, either in its crude or purified state, essences or all other preparations made with or containing it, has, in the course of the last seven or eight years, been directly responsible for two hundred and forty-two cases of total blindness and sixty-two cases of death. The report shows the danger incurred in introducing that alcohol in the system in any form whatever, either by ingestion or inhalation in the lungs. Naturally the use of liniments, cosmetics, &c., containing wood alcohol exposes the person using them to the second mode of absorption.

Those observations have nearly all been made in the United States. We have no Canadian statistics regarding that particular substance. I have found that wood alcohol is used by several manufacturers for making liniments, toilet waters and even in some cases it is used for making preparations that can be taken internally.

It has been reported that in the month of September, 1904, the province of New Brunswick was the scene of three tragedies due to the use of wood alcohol as a beverage. On September 11, four men went on a drunk, at Moncton. Their funds being insufficient to procure whiskey enough, and grain alcohol being refused to them at the drug stores, they purchased methylated spirits. Two of the party were evidently accustomed to prolonged sprees, as their arrival at home in a condition of intoxication excited little comment. They remained in a comatose condition for some time and then died. The relatives of the other two men became alarmed, called a physician, and after some hours' hard work the effects of the poison wore off. The inquest on the deceased members of the party was postponed until the complete recovery of the two second ones. The jury returned a verdict according to facts adding a recommendation that methylated spirits be labelled 'poison.' The third death occurred in St. John in somewhat similar circumstances.

In localities where the sale of spirituous liquors is prohibited, it is of frequent occurrence that dipsomaniacs, when under the influence of the disease and in their craze for alcohol, substitute to it flavouring extracts such as lemon, peppermint, ginger and others, they even resort to drinking Florida water, bay rum and other toilet requisites known to contain alcohol. It is reasonable to believe, when once attention is drawn to the ridiculously low figure asked by some manufacturers for that class of goods, that a good number of them are made with wood alcohol. It is easy to foretell what would happen should some of these extracts be used by the afflicted persons just mentioned.

On May 2, 1905, delivering his address as president of the Louisiana Pharmaceutical Association, F. C. Godbold, requests the state to adopt excessively severe laws against the use of wood alcohol for those purposes. He goes further and says that the federal authorities ought to prohibit the manufacture of it, as people can easily do without it altogether.

It is sure that adulterated drugs were not seen as often as they are now, when the retail druggists manufactured themselves all their pharmaceuticals and when competition was not as keen as it is nowadays. If competition is a good thing and is the life of trade, there is no reason why it should not be checked to some extent when it becomes a menace to public health.

The necessity for authoritative standards of pharmacopœias to fix the nomenclature, define the character, establish the purity and regulate the strength of brands of materia medica products, is recognized by all civilized countries; and the pharmacopœias of all nations, except those of the United States, Chili and Greece, are issued under the authority of the respective governments, and therefor partake of the nature of laws. The United States pharmacopœia, although acknowledged to be one of the best pharmacopœias published in the world, carries very little authority with either physicians or pharmacists. That state of things exists in the United States and Canada (we do our business in that line, just as it is done in the United States), because the market is flooded with unauthorized materia medica products of



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secret or semi-secret composition, and that destructive competition, in which quality is sacrificed for price, exists. For the same reason we suffer from that useless duplication of brands, which has become such a serious annoyance to the pharmacists, who are obliged to carry in stock a large number of brands of medicines which ought to be identical in names and composition. Each manufacturer assumes to be a law to himself and spends a great deal of money and energy to convince the medical profession that his brand is the best—not because his brand corresponds with authoritative standards, but on the ground that he has a standard of his own which he does not divulge for commercial reasons, and which is far better than the standards of his competitors.

That system may possess some good features, when all the operations are controlled properly; it is the bad faith of some of the manufacturers that is most to be feared, because it may be easily put into action and it is very difficult to exactly determine if a preparation is really made according to the given formula. Some preparations of that class of manufactured goods have been the subject of chemists' analyses. It has been my privilege to examine the records and listen to explanations given by some of them. They have found pills labelled as containing  $\frac{1}{60}$ th of a grain of strychnine that contained twice as much as supposed to, and again in the same vial some of the pills only contained half or less of the quantity. Such things happen when the mixture of drugs before the dividing into pills has not been properly made. It is a case of carelessness that might prove to be fatal. For the sake of gain, quinine pills supposed to contain two grains only contained one or one and a half grains. Morphine tablets, labelled as quarter grain, only contained one-eighth or one-tenth of a grain. Cyanide of potassium has been found in small quantities in Bland's pills. The object of putting that drug into the pill mass was of helping it to maintain its original greenish colour. Preparations labelled aromatic extracts of Cascara Sagrada, were found to be made entirely out of buckthorn and senna and aromatics. I am only mentioning a few of the preparations analyzed.

The American Medical Association has appointed a committee composed of chemists, pharmacists and physicians to define the conditions on which such preparations would be allowed to be advertised in the journal of the American Medical Association, and therefore, could be recommended for use. The following rules were adopted to guide the council on pharmacy and chemistry of the American Medical Association:—

(The term 'Article' shall mean any drug, chemical or preparation used in the treatment of disease.)

Rule 1.—No article will be admitted unless its active medicinal ingredients and the amounts of such ingredients in a given quantity of the article, be furnished for publication. Sufficient information should be supplied to permit the council to verify the statements made regarding the article, and to determine its status, from time to time.

Rule 2.—No chemical compound will be admitted unless information be furnished regarding tests for identity, purity and strength, and, if a synthetic compound, the rational formula.

Rule 3.—No article that is advertised to the public will be admitted; but this rule will not apply to disinfectants, cosmetics, foods and mineral waters, except when advertised in an objectionable manner.

Rule 4.—No article will be admitted whose label, package or circular accompanying the package contains the names of diseases, in the treatment of which the article is indicated. The therapeutic indications, properties and doses may be stated. (This rule does not apply to vaccines and antitoxins nor to advertising in medical journals, nor to literature distributed solely to physicians.)

Rule 5.—No article will be admitted or retained about which the manufacturer, or his agents, makes false or misleading statements regarding the country of origin, raw material from which made, method of collection or preparation.



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Rule 6.—No article will be admitted or retained about whose therapeutic value the manufacturer, or his agents, make an unwarranted, exaggerated or misleading statement.

Rule 7.—Labels on articles containing heroic or poisonous substances should show the amounts of each of such ingredients in a given quantity of the product.

Rule 8.—Every article should have a name or title indicative of its chemical composition or pharmaceutic character, in addition to its trade name, when such trade name is not sufficiently descriptive.

Rule 9.—If the name of an article is registered, or the label copyrighted, the date of the registration should be furnished the council.

Rule 10.—If the article is patented—either process or product—the number and date of such patent or patents should be furnished. If patented in other countries, the name of each country in which patent is held should be supplied, together with the name under which the article is there registered.

*Explanatory Comments on the Rules.*

Rule 1.—Certainly no one can object to this rule. The physician not only has the right to know, but it is his duty to know, the composition of medicines he prescribes for his patients. He may not be interested in the details of the method or of the process of manufacture of an article, but he should know what medicinal agents it contains, and the amounts represented in a given quantity of the article.

Only in exceptional instances it is necessary for the physician to know the solvent, vehicle or other diluent, or the particular flavouring agent which may have been used. For this reason, while the council desires the formula and the details as to the method of preparation to be sufficiently complete to enable it to verify the correctness of the assertions made regarding an article, the description to be published will usually consist only of a statement of the amount of each medicinal agent or ingredient in a certain quantity—generally the ordinary dose—of the article, and in some instances the general character of the solvent or vehicle and flavours. In preparations for external use, the therapeutic efficiency is greatly influenced by the nature of the vehicle. Therefore, in such preparations, the character of the vehicle or base should be stated, so that it may be known whether the article is penetrative or simply protective.

Rule 2.—In order to avoid errors in case of chemical compounds and to guard against adulteration, lack of potency or strength and mistaking one chemical for another, it is necessary to have at hand suitable identity tests. Where these facts have appeared in the literature, or in standard text books, reference to them will be sufficient, but with new chemicals, specially synthetics, the manufacturer or his representatives will be required to supply such tests to the council, together with rational or structural formula in order that an intelligent opinion of these products may be obtained.

Rule 3.—While the correctness of the principle that the physicians cannot be expected to favour any medicines which are exploited to the lay public will be readily conceded, this rule is to be modified in its application to articles not strictly medicinal.

Rule 4.—This rule may appear to some as radical, and yet on consideration it will be found just to the public, to the physician, to the manufacturing pharmacist and chemist, and also to the retail druggist. It must be remembered that it applies only to the package, and to the labels, circulars, &c., accompanying it. It does not in any way interfere with advertising, circulars, literature, &c., furnished to physicians. Experience has clearly shown, however, that it is not safe to enumerate on the package the diseases in which an article may be indicated, since it is also the means by which the laity, who are not competent to determine whether or not its employment is safe and proper, may be induced to continue its use or to recommend it to others quite regardless of the evident dangers of forming drug habits or of doing serious injury by employing a remedy that in reality may be contraindicated. It is the physician's



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prerogative to determine in what disease the article may be indicated, and he is not supposed to go to the drug store for his knowledge regarding this. It is not the function of the pharmacist to recommend or to prescribe medicines, but only to be familiar with their pharmaceutical and chemical characters, strength and dosage and with the best forms of administration.

It is asserted that the naming of diseases on the label of the packages is necessary, because many physicians will be unable to tell from the therapeutic properties alone in what diseases a medicinal article may be indicated. This may be true with a certain class of doctors, but it is certainly not true with the vast majority of the educated, progressive physicians of America, and this is the class whose interests are concerned in this movement. There may be some exceptional articles, such as foods, digestants and mineral waters, in which the therapeutic properties alone may not sufficiently indicate the use, and in these cases, perhaps, reference may be made to certain symptoms. If such references occur they will be carefully considered. Antitoxins and vaccines come under this exemption. The council, however, is unanimously of the opinion that this method of exploiting the medical profession is one of the principal causes which has made the vast physicians hesitate to prescribe any proprietary medicines, has led others into irrational therapeutics, has made pharmaceutical tyros believe that they could prescribe just as well as physicians, and has been the means of causing scores of these medicines to be used for self-medication by the laity, to the detriment and sometimes to the serious and permanent injury of the person taking them. The physician would prefer that the manufacturer confine himself to furnishing the articles and reasonable information regarding their identity, quality, strength and pharmaceutical and chemical character, leaving the physician to indicate in what diseases they should be used.

It is believed that the application of this rule will most quickly determine what manufacturers would rather have the preference and favour of the vast majority of the medical profession and of the members of the American Medical Association than the doubtful support of a rapidly disappearing minority of practitioners.

Ample time will be given manufacturers to conform to this rule, and also to rule 8, entailing changes in labels or in other printed matter.

Rule 5.—While this is a rare contingency, yet in the past many rank frauds of this nature have been perpetrated on the profession—and this rule will have a tendency to prevent such attempts in the future.

Rule 6.—As in the preceding instance, this rule will have the tendency to restrict manufacturers or agents in their claims as to the therapeutic superiority of their products, without interfering with any reasonable assertions, especially when such are confirmed by clinical data from responsible medical men.

Rule 7.—For the information of the pharmacist or dispenser, and to enable him to act as a safeguard to the patient and to the physician, all medical articles containing such potent agents as the poisonous alkaloids and other organic substances and the salts of some of the metals, should have the exact amount of these ingredients contained in the average adult dose stated on the label. A list of these potent substances will be prepared for more specific information.

Rule 8.—In order to prevent the confusion now existing with reference to many articles known only by more or less arbitrary selected or coined, usually protected names, it is necessary that every article that is intended solely for physicians' use or prescription be designated by a scientific title or by a name descriptive of its pharmaceutical character, and, as far as practicable, of its principal medicinal constituents. Synthetic chemical products should give the true chemical, constitutional or structural name, in addition to the trade name. The application of this rule will enable physicians to use many of these articles which at present they are afraid to use because of uncertainty as to the identity—owing to the similarity in the names of many of these entirely different products—or prefer not to prescribe in order to avoid criti-



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cism and the danger of self prescription by their patients. This provision will thus be of great benefit to manufacturers of meritorious products, will relieve pharmacists of many trying situations in interpreting correctly the names of articles desired by physicians, and will protect both physicians and laity from the evils named.

The council will use reasonable discretion in enforcing this rule with reference to trade names of long established articles.

Rules 9 and 10.—This information is required to enable the council and others interested, to determine the legal status of these articles and for ready reference through publication.

With the aims and object of this council no honest man or woman can find fault. We need just such work accomplished and we need it badly. The shelves of pharmacists are being incessantly loaded with worthless preparations which unposted medical men are wiled into prescribing by smooth-tongued detail men, tempting advertisements, and free samples. After the druggist has become stocked with such worthless stuff the doctor becomes disgusted with his results and quits prescribing it. As a result, package after package and bottle after bottle accumulate on the shelves to increase the difficulty of finding standard goods. The price of these nostrums is usually high, so that the dead stock represents a considerable amount of capital. The druggist sometimes analyses such goods, usually to find that a goodly number of them are very nearly the same in composition, and a temptation to substitute it is presented to them. When substitution is easy, the conscientious druggist is at a disadvantage as compared with his unscrupulous neighbour, and so he ought to be in favour of anything which will tend to remove this disadvantage.

When travelling and while visiting physicians and druggists in connection with this report, I have been convinced that the class of medicines known as *patent medicines*, is the one most objectionable, in its present state, because there is no control whatever upon their composition.

The general idea that the physicians and pharmacists reluctantly see the growth of the interest taken by the public in that class of remedies, because their benefits are smaller than on other class of goods, is prevalent. It is an uncalled for untruth. On the contrary, it is well known that the use of patent medicines has brought more clients to the physician's office, than has ever typhoid or smallpox. It is absolutely unfair to attribute such selfish motives to the medical and pharmaceutical professions.

Their principal reason for condemning such medicines is the secrecy in which their composition is held and consequently the danger incurred by the public in using them. Most of the patent medicines on the market, and sold only on the merits of the large advertising contracts signed for publication on their behalf, have been analysed by chemists connected with medical or pharmaceutical journals or reviews. In most cases it was found that those preparations, when containing drugs of any consequence, contain substances the use of which by the public, without the proper recommendation from the physician, is dangerous. The results of these analyses have been published in the medical papers and it is no wonder that, in possession of such information, the physicians condemn the system itself as dangerous. In some cases it is demonstrated that the medicine is duly indicated for a few of the diseases mentioned in the advertisements, but there remains the danger of an uncontrolled dosage.

One would like to know what amount of medical or pharmaceutical knowledge is exacted from the manufacturer or owner of a proprietary medicine. The manager of a company exploiting one of these preparations who was called upon to define the key to success in such a commercial enterprise, candidly acknowledged, after thinking over the matter, that: 'First, whoever wants to occupy an enviable position in that line of business must be a *born advertiser*. He must have the courage and nerve to invest with confidence a large sum of money and adopt a plan which he will follow. Secondly, he must patiently await returns.'



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That is all. It is of no use to see that the medicine is of real value, whose merits you will honestly proclaim; just advertise properly. No use whatever for medical or pharmaceutical knowledge.

The advertisements of the large majority of those preparations are coupled with so many lies that it is impossible for a person possessing the least notions of medicine or pharmacy to call them anything else than *fakes*.

My attention has been drawn to a case which occurred some years ago and illustrates fairly well the general style of putting patent medicines on the market and the preparation therein mentioned is pretty near what we can call typical of the class.

To introduce a new remedy, it is well to have historical facts regarding its origin to relate. The discovery of the great remedy must have been by accident or after many years of long and persevering study. In this last class falls the 'old German chemist' who, through years of poverty—years varying in number from fifteen to fifty—this venerable man toiled in his laboratory in search for a cure for the ailment which had hitherto baffled the world's science. Trials and discouragements beset him, but at last his precious elixir was perfected. In the case I want to mention, the patient old chemist happened to be Samuel A. Buckland, M.D. Dr. Buckland had hit upon the only infallible cure for the morphine habit. His own portrait, beaming with benevolence, headed every advertisement. So kindly was the visage that it seemed to every sufferer like the face of an old friend. And such it proved to be, for after a few years some one found its exact duplicate in a dictionary of biography. There it was labelled 'Ludwig Spohr, German composer.' It was discovered at the same time that the morphine cure contained about half a grain to the ounce. No wonder the taking of the elixir satisfied the craving for the drug.

Amongst ten patent medicines advertised as containing no alcohol and being a sure cure for drunkenness, and which were analyzed in the laboratory of the Massachusetts Board of Health, six were found to contain alcohol in the following proportions: 41·6, 28·2, 26·5, 25·6, 20·5 and 19·5 per cent. Anybody taking enough of those medicines did not feel any craving for whisky.

No doubt, there are proprietary medicines of some real merits and are really commendable, but, unfortunately, according to the experience of physicians and druggists, they are very scarce.

A few American journals have entered on a crusade against patent medicines. They undertake to demonstrate that there lies an immense fraud hidden under the name of medicine. Still the editors are far from being in a position to judge, as the physicians or druggists, because they get their information second-handed, while the others observe for themselves.

A fair and equitable regulation concerning the manufacture and sale of that class of medicines would certainly meet with no opposition on the part of the proprietors of trade marks used on preparations of real merit and advertised in good faith. The opposition would come from manufacturers of fakes, who would see their opportunity of exploiting the public, vanish away.

It is well known that most of the companies interested in the manufacturing of patent medicines, have, for their only ambition, the size of the dividends they will pay their shareholders. The welfare of the public that they claim to be their object in view, is nothing in their estimation. It is also well known that the original cost of those goods, to the manufacturer, is a mere trifle, a nominal figure, compared to the selling price. The only real investment made is the expenditure made in advertising. It is useless to draw attention to the kind of advertisements made; the daily press is filled with them and anybody can judge for himself.

Probably the most dangerous aspect in the system, is this one: the advertisements are addressed to the public itself who are no judges of the question. These advertisements are mostly suggestive, explaining, and exaggerating a series of symptoms of every day occurrence even in persons enjoying a perfect health, symptoms without any consequence, and concluding to the presence of some dangerous disease with a long



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Latin name, which can be cured by the famous medicine. Many persons believing they are sick, purchase medicine of which they know absolutely nothing and which may contain substances that would do them more harm than good.

Amongst the so-called patent medicines, there is one class, the manufacture, sale as well as the advertising of which ought to be simply prohibited because of the immoral character of the goods. I mean these preparations in the pill or any other form, but especially in the former, claimed to be of such help to women and recommended for monthly use. The advertisements are written so any person interested may reach the conclusion that they can procure abortion. There is quite a demand for that class of goods, and I am afraid that a great many women have fallen victims to their faith in the effectiveness of these preparations. It is generally conceded though, that they contain no emmenagogue principle, but are put up as a mere speculation on human weakness. I can not refrain from drawing most specially, your attention to this class of proprietaries. There is one of two things certain; they really contain substances possessing emmenagogue properties or they do not. If they do, the manufacture, the sale and the advertising of them is evidently immoral and constitutes a permanent menace to the life of persons using them. If they do not, as it is believed to be the case (for it is hard to believe that, for the sake of gain, men could resort to such means and could be deprived of moral sense to the point of lending their knowledge to such a crime) then it is the obtaining of money under false pretences. Whether they are one or the other, they ought to be prohibited as criminal.

Coupled with that class of merchandise there is another one, the prohibition of which would also meet with the approval of all good citizens in the Dominion. I refer to the patent medicine of the 'Lost Manhood' type. They ought to be prohibited, because they are immoral frauds.

Both kinds are generally manufactured by the same manufacturer.

Any dealer, whether he be a wholesale or a retail one, who would be found in possession of such preparations should be punished at least as severely as the man caught selling or keeping for sale smuggled tobacco.

A large number, in fact most, of the preparations advertised as being reconstituent tonics and general builders, contain heroic drugs, the use of which, without the proper recommendation from the physician, ought to be impaired in some way. The provinces of the Dominion have in their statutes laws regulating the sale of poisons to other people than physicians. Thus, in the province of Quebec, the sale of cocaine is only allowed, when called for without a physician's prescription, provided the buyer is well known or introduced by a responsible person to the seller. The sale must be recorded in a special register called 'Poison Register,' that is, or ought to be, found in all drug shops, such record stating the date of the sale, name and quantity of poison sold, purpose for which it is required, name of buyer, signature of buyer and his address, and signature of person introducing him. Those precautions are really necessary, and, while being the means of preventing many accidents, are of great help in keeping people from getting addicted to some drug habit. The same rule applies for the sale of all poisons mentioned in schedule accompanying the law, a schedule which is, for the present day and since the new discoveries in pharmaceutical chemistry, far too short. Such laws have evidently been conceived with the intention of preventing all kinds of poisons from being sold broadcast, because poisons are dangerous in the hands of the uninformed individual, and also to protect the public against that natural tendency of taking any substances which prove to afford a certain temporary physical *bien-être*, and readily getting into the habit of taking these medicines.

But are the objects of these just and reasonable laws attained, and do they bring all the good they were intended to, when any person so desiring can procure morphine by buying almost any soothing syrup on the market, cocaine by purchasing almost any one of the numerous catarrh powders sold as patent medicines, or strychnine or digitaline in the same way, are sold right and left without any control and when the



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druggist himself, whose duty it is to caution people when selling dangerous drugs, is not supposed to know the composition of what he is selling? The foregoing applies to people who purchase these preparations, knowing what the result will be of their use.

Let us consider now the case of the person buying them without the least knowledge of their composition, and perhaps not knowing or suspecting that the laws of a great country, in this twentieth century, would allow poisons and dangerous drugs to be sold like bread and butter.

It is well known that a large number of patent medicines contain morphine or cocaine. These are the two drugs which form most drug *habitués*. Any person taking a preparation containing one of those drugs, on account of its properties, will feel an immediate effect which would certainly afford great relief to the sufferer. After a short space of time the soothing effect has disappeared and the patient, in order to enjoy the same comfort as before, repeats the dose. After a certain time it is found the relief afforded lasts considerably less time, and the patient must necessarily either increase the dose or repeat oftener. When the poor person finds out he is a morphine or cocaine fiend, it is then too late. Allow me to cite an article which appeared in the *Druggists' Circular* for July, 1904, entitled 'The danger of a narcotic habit from proprietary remedies':

Nearly every physician who makes a specialty of treating drug habitués asserts that the drug habit is growing among the people. Laws have been passed in many states that seek to put a stop to indiscriminate sale of narcotics by pharmacists. A late issue of a health journal for lay readers says: The far-reaching effects of this evil can scarcely be imagined, much less described, and only such as have been promising young persons of both sexes gradually lose their ambition, their character, sacrificing their virtue and all that morality and religion teaches them to uphold and maintain, can understand the full import and extent of this great and growing evil. It incapacitates the physician, defiles the sacred desk, sullies the ermine of justice, clouds the most brilliant intellects and fastens its most merciless fangs upon every class of the people.

Drug addiction is in the main confined to the use of opium, or its alkaloid morphine, and to cocaine. It is generally conceded that morphine has made more friends than has any other drug. With the speed at which the cocaine habit seems to be growing, that alkaloid stands a good chance of soon becoming a close second to the older one. The use of certain catarrh snuffs, if not the sole cause of this rapid growth of cocaine addiction, takes at least a leading part. If boards of health and boards of pharmacy would look after those who freely distribute samples of these snuffs in the streets and from drug stores, in violation of the law, there would probably be a decline in the rate at which such victims multiply.

Every package of secret medicine containing a narcotic poison should carry a label bearing the word *poison* in large red letters, with a skull and cross bones. When druggists sell these poisons in any other form than that of a secret medicine, they are compelled to label them in this manner and take the name and address of the buyer in a poison-book. There is no reason why the pharmacists should be compelled to do this with ordinary retail sales of such goods and not be compelled to do it with nostrums. The manufacturers of Mrs. Winslow's Soothing Syrup are permitted in this country to send out their goods without a warning to mothers as to the character of the preparation they are feeding to their babies.

In England they manage this a little better, for every package sold in that country must acknowledge the presence of morphine and must bear the word *poison*. While some benefit to the public is no doubt secured by this regulation it fails to accomplish all that the Pharmacy Act aimed at because of the ingenious way in which the spirit of the law is circumvented. Instead of having the word *poison* on the package as large and conspicuous as are the words *soothing* and *syrup*, it is introduced in small type at the bottom of the label and reads: 'This preparation con-



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taining among other valuable ingredients a small amount of morphine is in accordance with the Pharmacy Act hereby labelled poison.'

25 cents.  
Mrs. Winslow's  
Soothing Syrup,  
For children teething.  
Curtis & Perkins, New York,  
The Anglo-American Drug Co., successors,  
Sole proprietors.

This new label, with the facsimile thus,  
Curtis & Perkins, is to guard against  
counterfeits and imitations.  
Copyright secured.

1s. 1½d. 1s. 1½d.  
Mrs. Winslow's  
Soothing Syrup,  
For children teething.  
Curtis & Perkins, New York and London,  
Sole proprietors.

This new label, with the fac simile thus  
Curtis & Perkins, is to guard against  
counterfeits and imitations.  
This preparation containing among other  
valuable ingredients a small amount of  
morphine is in accordance with the Phar-  
macy Act hereby labelled 'Poison.'

Facsimile of label used in the United  
States, with no mention of poison.

Facsimile of label used in England, show-  
ing the word 'Poison.'

The illustrations show just how the proprietors of this medicine partially get around the English Pharmacy Act and wherein the English label differs from the American (or Canadian).

Our state boards of pharmacy owe it as a duty to American mothers to get laws passed compelling its manufacturers to declare to American users that Winslow's Syrup contains morphine. These manufacturers are causing multitudes of American babies to acquire a liking for morphine so that when they get older and accidentally or otherwise discover the pleasant and satisfying effect it has upon their nervous system they are strongly tempted to continue taking it. The habit of the infant thus becomes the ruin of the man or woman. The mother who does not know its composition can not be blamed for giving this syrup. The state should, in the way suggested, instruct her as to its composition and its nature so that she alone would be to blame if the little one grew up a confirmed opium or morphine fiend. Any board seeking to get such a law passed should see to it that evasions of the intent could not occur, as in England.

That article applies as well to the situation in Canada as in the United States and the same can be said of all the soothing syrups on the market.

A good number of catarrh powders have been proved to contain as much as two per cent of cocaine. When the person using one of these preparations gets informed on the nature of the particular ingredient affording him relief, he simply purchases the cocaine itself, when and where he can get it in its pure state. It is well recognized that the drug habit is infinitely worse than drunkenness because it is ever so much more difficult to cure the poor victims of that habit.

Lately the principal advertisements made for those preparations have been made by means of distribution of free samples of the medicine, accompanied by literature greatly exaggerating the importance of symptoms therein described and recommending the constant use of the medicine advertised. Such assertions are bad enough when applying to innocuous preparations containing no dangerous substance; but they become criminal when they incite the ignorant to become the slave to the degrading cocaine habit. The brutal selfishness of those moral lepers who, for filthy gain, are willing to sacrifice their fellow creatures in so horrible a manner is appalling. According to statistics gathered in 1903, not less than nine-tenths of the cocaine habitués have been led there by the use of proprietaries or prescriptions containing it.

If exception is made of proprietary medicines and preparations of a non secret composition containing some of these poisons, they are almost entirely under the immediate control of the retailer, and a large number, I would say the great majority of the retailers loyally shoulder the responsibility. That vast majority spares no sacrifice, even when detrimental to their business, in order to suppress the formation of drug habits. The responsibility of the wholesaler and the manufacturer has not yet



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been properly established, and the laws of our country ought to establish same and not allow the sale of dangerous drugs in however small quantity they may be contained in that apparently benevolent and eminently popular form of medicines called 'proprietarys,' without restrictions, as it is done to-day.

In 1902, the American Pharmaceutical Association took into consideration the report of a special committee appointed to inquire into the extent of the increase in the drug habit.

The work of the committee was centered on the consumption of the alkaloids morphine and cocaine. It was shown that the importation of opium, from which morphine is obtained, of a value of \$162,652 in 1898, had been \$1,263,369 in 1902. And at the moment when they were preparing the report a message was received from San Francisco, telling of the entry in port of a consignment of opium, in one single cargo, valued at one million dollars. The statistics have also shown that in 1898, the importation of cocaine had been of a value of \$59,660 and in 1902 had been up to \$254,704. It has been demonstrated by reports from medical bodies, that the legitimate consumption of cocaine had in no way grown, because it is most exclusively used in surgery and that for a few years past, it has very seldom been left to the patient himself for use. The market prices of these substances, were practically the same in 1902 as in 1898.

Another class of proprietary medicines which is acquiring an every day growing importance and demand is the 'headache remedies' in powder, wafer or pill form. Although in most cases so far, those preparations are in the hands of honourable and trustworthy proprietors, some have been found to contain morphine. They are nearly all composed of coal tar derivatives, and the medical faculty, on account of complications and accidents which have accompanied their administration, feel it is a great risk to allow the general public to have those drugs handy in the house. Though not generally dangerous when given in small doses, they may become so by accumulation. And a suffering person is rather inclined to increase rather than decrease a dose of medicine. Those preparations ought to be allowed only after making sure that their composition is not dangerous, that the label warns sufficiently against overdoses and especially that morphine is not present.

But the class of proprietary medicines causing probably the most discussion and seeming to be in the public mind the most objectionable, is certainly that series of preparations containing alcohol.

It is evident that a large number of them contain a percentage of alcohol absolutely in excess of that required for extraction of active principles from organic drugs or for preservation of same. Some analyses have shown an alcoholic strength in some of those preparations varying from twenty to forty per cent. In 1896, the analyst of the Massachusetts Board of Health, has found some of them containing as high as 47.5 per cent. The doses recommended varied from a teaspoonful to a wineglassful. In many cases it is stated that the dose can be increased if needed. As I have already remarked, the tendency of the general public being rather to increase than to decrease doses of medicines, even when there is no recommendation to that effect, the result may well be anticipated.

In 1900, Mrs. Martha M. Allen, superintendent of the department of non-alcoholic medication for the National Women's Christian Temperance Union, published a book on 'Alcohol, a dangerous and unnecessary medicine,' in which she reproduced the results of the analyses made by the chemist of the Massachusetts State Board of Health, in which the least known of the remedies mentioned were omitted. This, naturally, brought the subject before the people most interested in the alcohol question and those who had often been innocently beguiled, in opposition to their principles, into the use of such remedies. The revelation which this book made stirred up intense interest and finally led to the demand on the part of the Women's Christian Temperance Union that all secret remedies be compelled to carry upon their



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labels an analysis or perfect formula of their composition in such language as any ordinary layman could understand.

The fact is that some of the remedies are used, or can be used, as complete substitutes for alcoholic beverages. Even in the doses advised on the bottles they stimulate sufficiently to create a liking for the effect that by continued use leads to intemperate habits. Teaspoonful doses of whisky may be administered to children without harm, if only given occasionally and at long intervals of time, but even half-teaspoonfuls given three or four times a day for months at a time are likely to produce an unnatural longing for it and a desire for larger doses.

Mr. D. S. Chamberlain, president of the Proprietary Association of America, says, in defence of the proprietors of patent medicines that, these gentlemen do not employ alcohol in manufacturing their preparations, willingly, but because they cannot do without it. The price of alcohol, he says, is so high that that alone is sufficient to prevent them using it, if they could only find an agent which would possess the same extractive and preserving qualities. It would be interesting to find out if every one single manufacturer of that class of goods has taken the trouble to investigate for an extractive and antiseptic agent that would answer their purpose as well as alcohol. Dr. Squibb has perfected a system of extraction for vegetable drugs without alcohol and I am sure that among the numerous known antiseptic substances, the manufacturers or proprietors could find what would answer perfectly as preservatives. Knowing those facts, it is rather difficult to appreciate, as he would like it to be appreciated, his argument. Mr. Chamberlain adds that, while making an attack on the patent medicines containing alcohol, they are attacking all the pharmaceutical preparations containing alcohol and daily prescribed by physicians.

We might say that the physician never prescribes alcoholic preparations to his patients without being in a position to do otherwise if he thinks such preparations might be detrimental to his client. All alcoholic preparations of the pharmacopœias have an identical non-alcoholic product in the form of extract or active principle. But, as it happens sometimes, the physician desiring the alcoholic effect as well as the other one, will prescribe tinctures. And then one must keep in mind that in these cases the dose of alcohol is so small that the patient very seldom takes more than ten to fifteen drops at a dose. However, such treatments are often altered, according to the progress of the disease, and the physician is certainly aware of what his patient is taking and is ready, on the least indication, to suppress whatever may seem to become useless or detrimental in the treatment.

It is not as much the fact of using a certain quantity of alcohol in a preparation that meets with such an opposition, but the secrecy of that fact, which entices people who can not or will not, to partake of alcohol, unknowingly.

In speaking about the Catholic Total Abstinence Union of America, in Hartford, Conn., on October 11, 1904, the Rev. Father Walter J. Shanley, rector of the cathedral of that city, and recently elected president, attributed the growth of intemperance among women to the presence of alcohol in medicines. His statement was made during a review of the total abstinence movement among young men and women. He referred to a letter he had received from a Washington physician giving information as to the percentage of alcohol in a large number of so-called patent medicines, and then warned his hearers against the use of them. He said that he was convinced that continued use of medicines which are fortified with alcohol produces a craving which is the forerunner of inebriety.

A physician in the Quebec district, assured me upon his word of honour, that one of his lady patients who had never tasted alcoholic beverages having read advertisements in the papers and in booklets distributed throughout the country about a widely known patent medicine, thought, according to symptoms described that she was suffering one of the diseases so insinuatingly described therein and naturally thought she would be cured by using the preparation. She took a few bottles of it and developed



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a liking for whiskey that nothing will check, and is now a regular tippler. She is now a great affliction on her family.

The physicians and druggists generally recognize that the only effect obtained from the use of those patent medicines is the stimulant of the alcohol contained in them. They are sold without any discretion by all merchants throughout the country. The moral effect is disastrous and the revenue of the country is decreased in proportion to the growth of that sale, under one of its most legitimate heads.

Amongst patent medicines, there are large numbers intended for outward application, such as liniments, embrocations, &c., &c. This category is probably the less dangerous one. However, it is to be feared, and I am justified in believing so, that a good many use wood alcohol when alcohol is required. It has been shown that wood alcohol ought not to be used externally.

Quite a number of pills are also advertised as being of an absolutely vegetable composition, although they contain mercury or one of its salts. By publishing that those pills are purely vegetable in their composition, the proprietor caters to the trade of that class of people who are prejudiced against the use of calomel and other inorganic chemical medicinal agents. According to some authors, the wrong may be of very little importance, but misrepresentation is flagrant just the same. I might say as much of a good number of preparations claimed to contain popular substances such as cod liver oil, peptonate of iron, mandrake, arnica, cascara sagrada, cinchona, figs and several others, but have no traces of them, but if they have them at all, do so in considerably less quantity than they are claimed to.

I will only mention, *en passant*, those patent preparations possessing no therapeutic effect whatever and are nothing but a pretext to exchange something for a certain sum of money. Our system of having no control whatever on patent medicines, is the cause that the manufacturer has very little care whether his preparation has any real virtue or not; as long as the advertisements create a call for his goods.

There is an anomaly in the manufacture and sale of patent medicines that ought to disappear, as long as no control is exercised over the finished product. It is the right extended to all individuals, whatever their calling, profession or training might be, to manufacture and sell, under the cover of registered trade-mark, a medicine of whatever nature it might be. It must be remembered that most of these preparations contain heroic drugs, the administration of which is not judicious except under the immediate supervision of a medical practitioner. How can these persons, probably possessed of good intentions, not only prepare drugs, inoffensive in themselves, but the combination of which is sometimes dangerous, recommend them to be used in all security against such or such diseases?

Nearly all complexion lotions and cosmetics contain bichloride of mercury. The analysis, in one particular case, has shown an amount of bichloride of mercury to the extent of 14·7 grains to an ounce of the product. That salt is one of the most, if not the most deadly poisons of inorganic chemistry; and it is left on the toilet bureau, without any warning whatever as to its nature. It must be remembered that half a grain is sufficient to kill any person taking it. It is true enough that these preparations, being toilet articles, can hardly be classified as drugs, but the nature of their composition is such that they ought to be classified as patent medicines and be subject to the same laws.

The French patent medicines have a just reputation of superiority over those of other countries. The importation of them, in Canada, is considerable, particularly for consumption in the province of Quebec. Still, rumours, which seem founded on facts, are current that the Canadian market is flooded with spurious articles. It would appear that a certain firm in France prepares imitations of some leading lines of French proprietaries, expressly for the Canadian market, thus escaping the usual formalities required, in France, before a preparation of the kind is allowed on the market. That firm will have representatives in this country, who, on the good reputation of the French preparations mentioned, would sell those imitations. The import-



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ance of the subject, to my estimation, is such that the government ought to take up the matter and probe it to the foundation, and punish the culprits, should this be proved to be the fact. Several druggists have assured me that they are in possession of proofs of all the facts mentioned here. To the public, such a state of things is serious. French preparations, owing to all expenses of getting them in this country, cost a good deal more than one may expect, it would be only fair to the consumer that when his physician recommends a French preparation, he should get what he wants to get. It is claimed that nearly all of those preparations which have a formula stated on their labels, are far inferior to the label claims.

For the accommodation of the retailer who is not in a position to have on hand specialties of his own, in all lines, a certain number of manufacturing firms supply a line of goods called generally *non-secret preparations*. The formula of such preparations are generally given to the retail druggist on effecting the sale and very often, in fact nearly every time, the goods are sold with the buyer's name and address on the label, which makes it appear as if the retailer had manufactured same himself. Often enough, the retailer, for a reason of his own, refuses to have his name printed on the labels and orders the manufacturer to print the name of a fictitious firm, supposed to be doing business in a far away place, or in a foreign country. Questioning druggists and manufacturers on the subject, I have gathered that the general opinion is that the use of such fictitious names should be forbidden by law. The fact that no responsible firm's name is given as makers of the preparations, affords a chance for any amount of adulteration. The manufacturer whether he be the retailer himself or a manufacturing concern, cares very little of the quality of what he is putting up when his name does not appear before the public and his reputation is not going to suffer directly, should the preparation prove to be of an inferior grade.

As far as the retailer's name being used, it is believed and more especially by the manufacturers themselves, that the name of the manufacturer should be coupled with it, thus :—

‘Manufactured specially for John B. Smith & Co.,

Retail druggists.

(Such a place)

by So and So Co., Ltd., of (Such a place.)’

In that way, there would be a double guarantee for the public, and the retailer would know that the manufacturer, having to publish his name as the maker, shares the responsibility and is interested to the same extent as himself in the reputation of the product. Manufacturers complain that some unscrupulous retailers request them to put up for them very inferior goods, their only object in view being to procure a cheap article to sell in competition with some patent medicine advertised. As things stand now, they have to put up those inferior goods, but refuse to put their names as manufacturers, and they do so very reluctantly. Were they forced by law to add their name to the retailers, they would be in a position to refuse such trade as they would think might injure their reputation.

I cannot close these remarks without drawing your attention very particularly to a state of things, the remedy for which I am not prepared to suggest, leaving it to your wisdom, and discretion, being entirely of a different nature than the one concerning this report, but which is really deplorable. I mean, the publication by the newspapers and reviews of prescriptions. During my twenty-three years of practice as a druggist, in the city as well as in the country, I have had occasion several times, to positively decline to fill some of these prescriptions, unless the patient would have them approved by a physician. Those prescriptions often call for poisons and also are often accompanied by serious errors. The danger incurred, more than offsets the good the public might derive from them. The persons copying these prescriptions in type not being familiar with the names of drugs, weights and measures used, don't understand the first word in them and are liable to commit errors which might prove to be fatal. Allow me to cite the



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following case as an example ; picked from hundreds which have come to knowledge : A newspaper, with all the good intentions we are pleased to credit to every one of them, wanting to be of practical use to its readers, just before vacation time, recommended as a sure cure for poison ivy, a lotion composed of ten drachms of cocaine hydrochlorate dissolved in four ounces of water. Ten grains were evidently meant, that is sixty times weaker. That formula, printed in one paper, went around the press, being copied from one to another, without the mistake being noticed and corrected. The prescription brought to a druggist was corrected, but supposing the case of a person being in a position to secure ten drachms of cocaine in some way or other and attempting to prepare the prescription himself, what would have been the result ? Supposing even that the formula would have been correctly printed, is it judicious that drugs as powerful and poisonous as cocaine, should be, simply by a newspaper, recommended for general use ? I understand that it is difficult, not to say impossible, to prevent the editors of newspapers from publishing formulæ and recommending some medicines, but they ought to make it a point to refrain from publishing such formulæ when they call for powerful or poisonous substances.

#### CONCLUSION.

Concluding from the observations I have made in accordance with your instructions, I believe that the actual Adulteration Act ought to be systematically enacted under the supervision and direction of a special branch of your department concerning drugs and entirely apart from the food section, conducted by experienced pharmaceutical chemists. Pharmaceutical chemistry being mostly organic, it is important that the chemist called upon to analyse fluid extracts or other galenicals generally, should be familiar with the process of their manufacture. In a word, pharmaceutical chemistry, is a specialty in itself. The chief of that new branch being an experienced pharmacist, would be in a position to understand thoroughly the nature and the scope of his duties. He would also be the individual to whom all complaints should be addressed and his duty would be to ascertain the truthfulness of such complaints, and, upon the report of the analytical pharmaceutical chemists on the product complained of, take action, should he be justified in so doing.

A distinction ought to be made between adulteration proper, which consists in deliberately replacing one drug by another one inferior in quality or deprived of the therapeutic properties recognized in the former, or in neglecting to insure to a product the recognized standard of strength, quality and purity with intention of lowering the cost of preparation, and the accidental introduction of impurities due to defective manipulation of the drugs. Great care should also be taken in purchasing the samples of drugs intended for analysis in order to do full justice to the parties implicated and to avoid giving to the enactment of the law the least appearance of persecution.

#### REGARDING PATENT MEDICINES.

Whereas, in some cases, those preparations possess real merits and their formulæ are the fruit of long work and often the result of several years of experience and observation. That the publication of the formula would favour indelicacy and abuses on the part of unscrupulous persons, it is not opportune and is most unfair to oblige the manufacturer to publish his formulæ. But, with the protection of the public in view, a board of control ought to be appointed, which would be called upon to examine all preparations with their formulæ that would be submitted to them for approval and would allow or prohibit the manufacture, importation or sale, under a penalty fixed by parliament.

That board ought to be composed of two physicians and two pharmacists and of the chief of the pharmaceutical or drug section of the Department of Inland Revenue, who would be, *ex officio*, president of the board. The duties of the board would be to take into consideration all formulæ of preparations submitted to them, with the list



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of ailments claimed to be treated by such preparations. Approved or disapproved of them entirely or in part, paying great attention to the fact that none but the therapeutic properties which they possess are designated by label, advertisement, circulars or any other literature treating on same. Refuse absolutely to approve all preparations the properties of which, if known to the public, might be conducive to immorality. Add or deduct words or phrases to labels, circulars and literature on approved preparations, when the board will think fit so to do, for the protection of the public.

Every person or company depositing a formula for approval would be obliged to supply the board, together with the formula, a certain quantity of the product, as it is ready for the market, the quantity to be fixed by such board, same not to exceed six packages of the largest size put up for sale, in order to afford facilities of analysis and comparison of the product with the formula. Later on, the board's duty would be to purchase, in open market from time to time, samples of such preparations, have them analysed to make sure that the manufacturer has not altered the formula. Should the manufacturer have done so, without having previously secured the consent and approval of the board, he would be responsible under penalty fixed by parliament. Every package of preparation approved by the board should bear affixed on the outside of the package, and placed so the package can *not* be opened without defacing it, a government stamp paid by the manufacturer; the value of such stamp would be nominal, that is, would not partake of the nature of a tax.

Together with every formula deposited for approval, the manufacturer should deposit a certain sum of money fixed by law, of which one-half would be refunded should the formula be approved and the whole confiscated should the formula be disapproved.

All amounts thus collected, as well as the amounts collected as fines under the provisions of the present *Adulteration Act* and the revenue from the stamps, forming part of the ordinary revenue of such branch or section of the department and being credited to its expense account.

Affixed to the present report is a list of the drugs reported to me as being the most often adulterated, or liable so to be, at the present moment.

A. E. DU BERGER.

MONTREAL, QUE., November 25, 1905.



## A LIST OF DRUGS MOST FOUND, OR LIABLE TO BE, ADULTERATED.

*Acacia*.—Powdered gum acacia is often mixed with starch. The gum itself varies in qualities or grades. The one sold as A No. 1 is often mixed with the lower grades. Gum senegal is used as an adulterant and substitute, but mostly in the lower grades of acacia.

*Acid Acetic*.—Short in percentage of real acid.

*Benzoic Acid*.—Artificial acid is substituted to the one recognized in the British Pharmacopœia, and which ought to be obtained by sublimation from benzoin.

*Boracic Acid*.—Although this article is generally pure, it is sometimes found containing borax. As that acid is frequently used in eye lotions, it is important it should be pure.

*Carbolic Acid*.—Carbolic acid, as it is generally found in trade, labelled 'pure white crystals, for medicinal use,' is frequently unfit for such use. It contains tar oils and cresylic acid. The difference between a chemically pure acid and this grade is so great in price that it is quite an inducement to use the cheaper one.

*Hydrochloric Acid*.—Impure acid sold as *commercial*, and only fit for use in arts and manufacture, is frequently dispensed in the diluted state for the chemically pure acid required by the British Pharmacopœia, and used in the preparation of nitro-muriatic acid dil.

*Nitric Acid*.—Same as for hydrochloric.

*Sulphuric Acid*.—Same as the two former acids, but not used in the making of acid nitro-mur. dil.

*Lactic Acid*.—Contains mineral acids, but specially sugar and glycerine.

*Oleic Acid*.—Contains fatty bodies and oils, stearic and palmitic acids.

*Phosphoric Acid*.—Often impure by the presence of arsenic, lime, ammonia and sulphuric acid.

*Tannic Acid*.—Adulterated with powdered nut galls, alum and sodium sulphate.

*Adeps*.—Pure lard is very hard to procure. It is adulterated with any fatty substance that may be used without changing the appearance of it.

*Aloin*.—Mixed with the inspissated juice (aloes).

*Adeps Lanæ*.—Quantities of cheap lanoline is offered on the market, adulterated with petroleum jelly.

*Aloes*.—There are different varieties of aloes. Socotrine and Barbadoes of the British Pharmacopœia are the most expensive and the cheaper varieties such as Cape and Curacao are frequently sold as Barbadoes or socotrine, specially in the powdered form.

*Ammonium Bromide*.—Is often found adulterated with bromates, chlorides and iodides. Sometimes, but very seldom, with sulphates and nitrates.

*Antimonium Nigrum Purificatum*.—Frequently contaminated with arsenic and adulterated with powdered coal. (Coal dust).

*Assafœtida*.—Contains calcareous rocks and other earthy matter. Assafœtida containing 65 per cent alcohol soluble matter as required by British Pharmacopœia is very scarce on the market.

*Aristol*.—An imitation of this product resembling it is often sold.



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*Ammonium Carbonate*.—Will contain bicarbonate of ammonium, sometimes chloride, sulphate and even lead.

*Alcohol*.—Is very often sold diluted with water and I have seen alcohol adulterated with a certain percentage of purified wood alcohol.

*Bismuth salts*.—Bismuth is rather an expensive article and is very largely used. Adulteration is frequent, chalk and phosphate of lime, seeming to be the favourite adulterants. Lately an importer of French drugs has sold quantities (at a low figure) of an adulterated bismuth subnitrate labelled *pure*. It contained nearly 50 per cent of a mixture of calcium phosphate and hydroxide.

*Belladonna*.—(Roots and leaves). Adulterated with the root and leaves of *phytolacca decandra* and leaves of *scopola carniolica*. Also root partly exhausted.

*Cera alba and flava*.—Beeswax in one of the most heavily and most frequently adulterated articles on the drug market, at the present time. Mineral matter, sulphur, starch, flour, resin, pitch, stearic acid, stearin, Japan wax, tallow, paraffin and osokerit as well as various other vegetables and insect waxes, are all reported to have been used at different times and some of them are still in frequent use. The first four mentioned are, however, rarely met with, as being too easy of detection. Of the rest pitch and resin are not much used, owing to the extreme brittleness they impart to wax, but all the others mentioned are very frequently found, sometimes in large proportions.

*Caryophillum*.—The high price of cloves has been the cause of considerable adulteration. Allspice was, in former years, adulterated by the addition of clove powder, the reverse is now the case. The fact that both cloves (*Eugenia aromatica* or *Caryophyllata*) and pimenta (*Pimenta officinalis*) belong to the same natural order (*Myrtaceæ*) favours the success of the adulteration. Pimenta costs at present, about half of what cloves cost. Another adulteration now frequently practised in clove powder, is the addition of the stems to the material to be ground, or the use of cloves mixed with the stems, as they come when imported.

*Cetaceum*.—Adulterated with paraffin.

*Cinchona*.—Complaints are made that quinine manufacturers, after obtaining all or part of the alkaloids, sell out the crude drug in the powdered state, and that would account for the low grade of cinchona sometimes found on the market.

*Copaiba*.—Copaiba is frequently adulterated with gurgun balsam, fats to the extent of six and eight per cent. It has been mixed in equal parts with Canada balsam and adulterators have prepared a mixture of castor and linseed oil with just enough copaiba to impart the odour and have sold it as pure copaiba.

*Cubeba*.—A good deal of the powdered cubebs on the market have been deprived of part of their oleo-resin which ought to be present to the extent of 18 to 22 per cent.

*Creosotum*.—Creosote obtained from coal tar is daily sold for the article obtained from beechwood. The word *creosote*, used in connection with any other product except that from beechwood, should be made a violation of the law.

*Crocus*.—Spanish saffron, the only one recognized by the British Pharmacopocia when not substituted by the so-called Canadian saffron, is sometimes adulterated with oil, sugar, deliquescent and earthy matters, and dyed beef or vegetable fibres. In a recent report of the board of health of the state of New York, out of twenty samples of saffron examined, seventeen were found adulterated.

*Cocaine*.—This article has been found adulterated with as much as 20 per cent of acetanilid.

*Cannabis Indica*.—Some has shown no physiological action whatever.

*Digitalis*.—Deteriorated digitalis is plentiful on the market. One of the most prominent physicians in the city of Québec declares that he dares not prescribe infu-



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sion of digitalis, because he can never rely upon the preparation owing the deterioration of the crude drug.

*Extracta Liquida*.—Number of those preparations do not contain the percentage of active drugs required by the pharmacopœias and some of them are made with wood alcohol. The retail druggist has to rely upon the manufacturer of liquid extracts to make, himself, a good number of the British Pharmacopœia tinctures.

The cheaper grades of distilled liquid extract of witch hazel, so popular nowadays, are known to be containing wood alcohol.

*Ferri et Ammonii citras*.—Is liable to contain alkaline sulphates and tartrates.

*Ferri et Quininæ citras*.—The British Pharmacopœia requires at least 15 per cent of quinine to be present. Any quantity of that drug is supplied containing only 12, 10 and 6 per cent of quinine.

*Filix Mas*.—Under the name of *male fern*, quite a number of species are apparently collected instead of the one for which the pharmacopœia calls. Prof. Rusby believes that much less than half the male fern sold is really genuine, and this may easily account for the lack of uniformity in its action complained of by physicians.

*Glycerinum*.—Glycerine is a drug of every day use in families. It is generally purchased, by the consuming community, in small quantities in drug and general stores. The latter are supplied with bottled glycerine by wholesalers. Very little of the glycerine supplied to the trade in that form is genuine and pure. It has been found highly diluted and thickened with sugar. Large amounts of impure glycerine made for manufacturing purposes enter the drug market. This fact is demonstrated by the analysis made by the large manufacturing drug firms when buying a supply of glycerine. In one special instance, out of twenty-six lots, twenty were found to contain from traces to 0.002 in twenty-five grams of arsenic. As glycerine is often given internally such an impure article might become dangerous.

*Hydrargyri Oxidum Flavum*.—Oculists complain of the impure and dangerous quality of yellow oxide of mercury on the Canadian market. Many accidents due to the impurities in the oxide have been reported.

*Hydrargyri Subchloridum*.—Is liable to contain perchloride. It has been sold in several localities, mixed with oxide of zinc.

*Hydrargyrum cum Creta*.—Frequently contains oxide of mercury.

*Hydrastis Canadensis*.—The powder is often sold when part of the alkaloids have been extracted. Samples have been found containing only 0.5 per cent when the yield should be from 2 to 3 per cent.

*Jaborandi Folia*.—Mixed with twigs, stems and sticks to the extent of 20 per cent.

*Liquores—Ammonia Fortior*.—Very often diluted.

*Liquores—Ammonii Acetatis*.—Frequently found either alkaline or acid and containing lead.

*Bismuthi et Ammon. Citratis*.—Often short of bismuth and containing nitrates.

*Calcis*.—Lime water is sold in large quantities every day and is specially used for infants and children. The importance of lime water is such that very particular attention should be paid this article. Absolutely inert lime water is too often sold for the right article.

*Hydrogenii Peroxidi*.—Hydrogen peroxide is acquiring more importance every day. Number of physicians complain that they have to be very particular when they purchase that article because quantities are practically valueless.

*Linimenta*.—These preparations have to be carefully attended to as they are liable to be made with wood alcohol, when alcohol is indicated as one of the ingredients.

*Lactucarium*.—When price is high, extract of lettuce is substituted to lactucarium.



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*Magnesii Sulphas*—(Epsom salt).—This chemical drug so universally known and so widely used, contains, in the low grade mostly in general stores, iron and zinc salts as well as other mineral salts.

*Magnesium Oxide*. (*Calcined magnesia*).—Is liable to contain carbonate.

*Magnesii Citras Effervescens*.—This salt is very difficult to procure. Most of the salt sold under that name is either a sulphate of magnesium or again a citro-tartrate of sodium. In England, when these last kind of goods are supplied, the seller is obliged to label it so: 'Granular Effervescent Saline (or salt), known commonly as citrate of magnesia.' This is not sufficient. The exact nature of the salt ought to be known by the label.

*Mel*.—Frequently adulterated with glucose and cane sugar. In many cases no honey at all is present.

*Olea Distillata*.—The distilled oils are among the drugs most adulterated to-day. It might be of some use to quote Dr. Geo. R. Pancoast and Lyman F. Kebler, who have made a special study of adulteration practised on distilled oils.

'In early times technical equipments for the production of volatile oils were very incomplete, and various expedients were necessarily resorted to for the purpose of extracting the many odorous principles from the host of plant tissues; fatty products, turpentine and alcohol were frequently employed for this purpose, and consequently there was a certain justification, formerly, for the presence of some of these solvents in certain essential oils. But modern methods render the use of these foreign substances entirely unnecessary and they must be looked upon as adulterations pure and simple.

'Adulteration is chiefly resorted to on the one hand because of its profitableness, and on the other hand because of the ignorance of the consumer and his desire to purchase as cheaply as possible. The latter frequently does not seem to care for quality, but wants quantity. It is often due to this that an honest producer may be induced to offer spurious goods because he cannot get reasonable prices, while his competitor is able to dispose of large quantities of adulterated oils. It must not be forgotten that formerly the adulterator could ply his art fearlessly without much danger of exposure, and this probably emboldened him. To-day he is compelled to act a little more cautiously owing to the developments of chemistry of terpenes and their derivatives, as well as a more or less complete knowledge of the composition of a number of the volatile oils. The "black art" of volatile oils is passing away.

'The writers are fully convinced that the large distillers and reputable wholesalers are not responsible for some of the adulterated oils met with, even though they pass through their hands. They are generally beyond their control, as will be seen by some of the subsequent remarks.

'The guileless farmer or peasant who constructs a crude still and collects oils by his primitive methods (besides the impurities to be expected from this source) frequently adds a goodly proportion of a cheaper oil or synthetic sent him by a friend in the wicked city. Synthetic oil is said to be largely used in this manner and the resulting product sold for true oil of wintergreen.

'The Turkish peasant in like manner and for similar reasons adds geranium oil to his rose leaves before he begins his distillation of pure otto of rose. Even John Chinaman forced to keep "open doors" manages to return to the "foreign devils" coal oil by conscientiously "plugging" some of the essential oils which he sells, especially oils of aniseed and cassia. And the warm-blooded Sicilian, in response to an increasing demand for his goods, rejuvenates a worn-out or poor quality of oil by adding the necessary constituents taken from a cheaper source; for example, oil of lemon is fortified with citral obtained from oil of lemongrass, and oil of bergamot is "pieced out" with lemon and orange oils.

'Then some of the primitive distillers themselves, and possibly some of the middlemen or the jobbers, try their hand at improving nature. This is practised in some



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instances to such an extent that the farther the oil travels, and the larger the number of hands it passes through, the more it adds unto itself, until finally, in some instances, at least, it is not recognized by its friends. Some of these adulterations may be due to ignorance, carelessness or accident, but many, very many, are due to design, and unless there is some improvement in this respect, we may be prepared to hear in the near future of some one liberally supplying himself with synthetics, esters, aldehydes, alcohol, oil of copaiba and plenty of French turpentine, then opening up an office with the sign "Essential oils made to order, while you wait."

'Essential oils are frequently met with that are unnaturally low in their characteristic constituents, so much that being otherwise satisfactory, only one conclusion can be drawn, viz., that they have been robbed or looted; for example, dementholized pepper-mint oil; oil of cloves, minus a large part of its eugenol; caraway, deprived of some of its carvone; and oil of lemon, abnormally low in citral. We shall hereafter for brevity's sake call this class of oils "looted oils." By such tactics a double profit is made by the manipulator. The consumer in these cases makes two purchases where he should make but one and save money by so doing; as for instance, he buys eucalyptol and a cheap oil of eucalyptus; then in order to make the oil answer the proper requirements, it is necessary for him to use the eucalyptol to strengthen his inferior oil of eucalyptus.

'Among the favourite articles used as adulterants, and to be looked for, are cheaper essential oils (turpentine, copaiba, cedarwood and gurjun balsam), alcohol and fixed and mineral oils.'

*Oleum Amygdale Amare Essentiale*.—There ought not to be any objections to the preparations of a so-called oil of bitter almonds made from apricot or peach kernels, but it ought not to be offered as the genuine article. The true oil is often adulterated with alcohol, nitrobenzol, turpentine and benzaldehyde. The latter is of frequent occurrence and is often totally substituted to the genuine oil.

*Anisi*.—Spermaceti has been found up to 35 per cent and alcohol up to 80 per cent. Also stearoptene from oil of fennel and oil caraway have been used to adulterate oil of aniseed.

*Anthemidis*.—Adulterated with oils of cedar, copaiba, turpentine and lemon.

*Cajuputi*.—Often deprived of cineol. A mixture of rosemary or savin with camphor and resin of milfoil is often substituted. Oils of camphor and turpentine must be looked for.

*Carui*.—Deprived of carvol and containing oil of turpentine.

*Caryophylli*.—With clove stems, fatty oils, copaiba, pimento, coal oil, turpentine and carbolic acid. Sometimes deprived of part of its eugenol.

*Cinnamomi*.—With cloves and cassia oils.

*Copaibæ*.—Oil of gurjun balsam.

*Coriandri*.—Oils of orange, cubeba, cedar and turpentine.

*Eucalypti*.—Deprived of eucalyptol, and cheaper grades of eucalyptus.

*Juniperi*.—Turpentine.

*Lavandulæ*.—Oil spike, oil of camphor, turpentine and alcohol.

*Limonis*.—Poor oil with citral from lemongrass added, poor or old orange oil and turpentine.

*Mentha Piperita*.—Often consisting of a mixture of peppermint, glycerine, alcohol and turpentine. Also pennyroyal, sassafras, oil of camphor. Often deprived of part of its menthol. Has been found containing as much as 25 per cent of turpentine and 15 per cent of acetone.

*Mentha Viridis*.—With turpentine.

*Pimentæ*.—With cloves and carbolic acid.



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*Rosæ.*—The leaves of *rosa alba* added to the *rosa damascena*, as the oil from this mixture contains more stearoptene, so that the distiller is able to add more geranium oil without reducing the melting point below the minimum. Also geranium or gingergrass, palmarosa, true oil of rhodium, light paraffin oils, fixed oils, guaiac wood oil, alcohol, spermaceti and paraffin.

*Rosmarini.*—With camphor and lavender, turpentine, spike oil, petroleum oil, alcohol and rectified camphor oil.

*Santali.*—With castor oil, copaiba, fatty oils, cedar wood, oil gurjun and West India sandals. One large manufacturing firm has told that it is difficult to procure pure oil sandal, that they have to import the wood and distil the oil themselves for their own use, notwithstanding the extra cost.

*Terebinthinæ.*—This oil so often used to adulterate other oils is also adulterated. A special prepared American petroleum is used for that purpose. Benzine has been found to the extent of 25 per cent.

*Olea (Exp.)—Amygdalæ.*—Expressed oil of almonds is very scarcely found on the market. The bulk of the oil sold is obtained from the wrong variety of almonds, peach and apricot kernals. Also adulterated with oils of colza, poppy walnut and benne.

*Olea (Exp.)—Lini.*—Contains mineral and rosin oils.

*Olea (Exp.)—Morrhæ.*—Animal and other fish oils.

*Olea (Exp.) Olivæ.*—It is very difficult to procure pure oil of olives. That oil so largely used as a condiment as well as a drug is sold right and left as 'pure,' and is very seldom so. It is frequently adulterated with castor oil and more so with cotton seed oil.

*Olea (Exp.)—Theobromæ.*—Adulterated with cocoanut oil. An imitation of it is made, but can easily be detected by the lack of characteristics, with wax and ordinary butter.

*Pulveres.*—All the compound powders of the pharmacopœia are complained of as adulterated. Special mention is made of the popular preparation known as seidlitz powders. I have met with seidlitz powders actually containing Epsom salt in place of the tartrate of soda and potassium. It is nearly impossible to procure these powders made according to the British Pharmacopœia.

*Pilulæ.*—Druggists who very seldom manufacture the British Pharmacopœia preparations in the pill form, complain very bitterly of some manufacturers who do not make them according to the British Pharmacopœia. Bland's pills, which have such prominence, have been reported as containing traces of potassium ferrocyanide to impart the greenish colour they ought to have, due to unoxidized ferrous iron.

*Paraffin Molle.*—Adulterated with soapy products.

*Phenacetine.*—Often adulterated with acetanilid.

*Potassi Bitartras (Cream Tartar).*—Very heavily adulterated with calcium phosphate, sulphate and tartrate, alum, starch, and sometimes contains lead.

*Potassi Bromidum.*—Contains chlorides of potassium and sodium, and is very much complained of generally by physicians.

*Potassii Carbonas.*—Reported to contain appreciable quantities of arsenic.

*Potassii Chloras.*—Some has been found containing zinc.

*Potassii Iodidi.*—This chemical drug is very often adulterated with bromide and bicarbonate of potassium. A reliable firm in Montréal has refused 800 pounds of it, in the early part of this year, because it contained nearly 40 per cent of bicarbonate. The lot apparently found its way on the retail market through so-called Cheap John houses.

*Rad. Gentianæ Pulv.*—Is adulterated with coloured pine wood and powdered almond shell.

*Rad. Hydratis Canadensis.*—Exhausted of its hydrastin.



*Rad. Rhoi Pulv.*—Adulterated with turmeric.

*Rad. Spigeliæ.*—There are two or three totally different plants called 'pink root,' that is the cause of so much spurious spigelia being found on the market; the adulterant or substitute, as the case may be, is absolutely worthless.

*Rad. Zingiberis.*—Adulterated with lower grades of ginger, and sometimes exhausted ginger root is dried and ground and sold for the genuine article.

*Saccharum Lactis.*—Mixed with cane sugar.

*Sandrac.*—Substituted by colophony.

*Salicine.*—Generally fairly pure, but has been complained of as containing traces of lead.

*Sapo Durus (Castile Soap).*—The name castile as applied in pharmacy to soap means only the kind made from olive oil and soda. Soaps made from other oils or fats are very often sold under this name, a practice which, of course, is fraudulent.

*Semen Lini Pulv.*—Adulterated with ground oil cake. Sometimes, and it is of frequent occurrence, according to reports, the flaxseed is entirely deprived of its oil—the ground cake is then saturated with a mineral oil of almost the same specific gravity as the linseed oil. Real genuine ground flaxseed is scarce.

*Semen Strophanti.*—Of this drug Professor Rusby, an authority, says: 'No drug is more certain or prompt in its action, or is used in more urgent vital cases than strophantus, yet more than 75 per cent of that used probably is spurious. One spurious variety is nearly inert, and I could cite a number of fatal cases resulting from failure to get its action. Another variety appears to exert a toxic action out of proportion to its therapeutical effect. I learned by accident that a large manufacturing house was habitually using the spurious article.'

*Spiritus Vini Rectificatus.*—Often diluted. Country physicians complain that they are practically unable to procure rectified spirit of proper strength. Complaints have been made that some firms mix a certain portion of purified wood alcohol with the rectified spirit.

*Spiritus Camphoræ.*—Often made partly or totally with wood alcohol, or deficient in camphor and containing water.

*Sodii Biboras (Borax).*—Adulterated with bicarbonate of soda.

*Sodii Bromidum.*—Adulterated with chloride and carbonate of sodium.

*Sodii Hypophosphis.*—Liable to be contaminated with sodium carbonate, calcium hypophosphite and phosphate, as well as phosphite.

*Sodii Iodidum.*—Chloride, bromide, iodate and carbonate of sodium are the adulterants to be anticipated.

*Sodii Phosphas.*—Adulterated with calcium phosphate, sodium sulphate, and was found to contain arsenious oxide in dangerous quantities, considering the doses of this drug that might be taken.

*Sodii Salicylas.*—May contain excess of salicylic acid and be adulterated with acetanilid.

*Sulphur Sublimatum.*—Sulphur often contains sulphuric acid and traces of arsenium and selenium sulphides.

*Sulphur Præcipitatum.*—Is liable to contain sulphate of lime.

*Tincturæ.*—This class of preparations is probably the one upon which adulteration is most practised. The wholesalers are practically the makers of all the tinctures used. Still I have met several druggists of high reputation who tell me that they are obliged to manufacture all their own tinctures, because they cannot be supplied with the right article by the wholesalers. The danger of employing adulterated or deteriorated crude drugs must be considered. A good many will use partly or totally wood alcohol instead of rectified spirits, especially in making tinctures intended for external use, such as arnica, camphor, iodine, etc., and tinctures taken in very small doses. Special attention must be paid to tinctures of standard strength of active ingredients, such as belladonna, nux vomica, opium, paregoric and others.







